

Amendments to the Drawings

Please replace the five (5) drawings sheets containing Figs. 1, 2, 6, 10a, 10b, 12a and 12b with the five (5) replacement sheets enclosed herewith. All of the amendments in the replacement sheets are supported by the specification as originally filed and therefore do not constitute new matter.

REMARKS

I. Status of the Application

Claims 1, 2, 5-12 and 21-36 are pending in this application. In the September 6, 2006

Office Action, the Examiner:

- A. Objected to the claims for informalities;
- B. Objected to the disclosure for informalities;
- C. Objected to the drawings as allegedly failing to comply with 37 C.F.R.

§1.84(p)(4);

D. Rejected claims 1, 2, 6-9, 11 and 21-24 under 35 U.S.C. § 102(b) as allegedly being anticipated by G. Asada et al., "Wireless Integrated Network Sensors: Low Power Systems on a Chip". Proceedings of the 1998 European Solid State Circuits Conference (1998) (hereinafter "Asada");

E. Rejected claim 1, 2, 5-7, 11, 12, 21, 22 and 26-36 under 35 U.S.C. § 102(b) as allegedly being anticipated by WO 00/54237 to Graviton, Inc. (hereinafter "Graviton"); and

F. Rejected claim 8-10 and 23-25 under 35 U.S.C. § 103(a) as allegedly being obvious over Graviton in view of U.S. Patent Publication no. 2001/0033963 to Yamazaki et al. (hereinafter "Yamazaki");

G. Rejected claims 6 and 22 as allegedly being obvious over Graviton in view of Asada.

In this response, applicant has amended the disclosure and drawings to address the Examiner's objections thereto. Applicant gratefully acknowledges the Examiner's efforts in

identifying the informalities as well as the suggested corrections, which were adopted in large part. Applicant has amended claims 1, 11, 21, 26 to further clarify the claimed subject matter. Applicant respectfully traverses the rejections of claims 1, 2 and 5-12, 21-36 in view of the foregoing amendments and the following remarks.

II. The Rejection of Claim 1 Over Asada is in Error

In the September 6, 2006 office action, the Examiner rejected claim 1 as allegedly being anticipated by Asada. The subject matter of claim 1 has been explained in detail in various prior responses and appeal briefs. However, it is noted that claim 1 has been amended to replace the words “operable to” with “configured to”. The change is one of form. Claim 1 has also been amended to recite the processing circuit is configured to “cause the output digital signal to be communicated to another element of the building automation system”. This amendment merely restates an existing limitation in a form that is less likely to be disregarded as being merely functional.

Asada does not anticipated claim 1. In particular, Asada fails to teach a processing circuit that is operable to, or configured to, “generate a first control output based on at least one set point and the process value...”, as claimed in claim 1. While Asada teaches a chip-based microsystem that is configured to obtain and communicate sensor values, that chip-based microsystem does not generate a control output as claimed.

In the rejection of claim 1 over Asada, the Examiner provided the following allegation with respect to the limitation of a processing circuit operable to generate a first control output:

(EN: Apparatus claims must be structurally distinguishable from the prior art. This is an intended use/functional limitation of the “processing circuit”. The prior art “processing circuit” of Asada et al. is capable of performing this intended use/function, if programmed to do so. Applicant has not positively

recited any computer program or software performing the function)
(September 6, 2006 Office Action at p.5). Thus, the Examiner does not allege that Asada teaches the claimed function of generating a control signal, but rather that the processor of Asada could be programmed to perform that function.

Applicants respectfully submit that there is no teaching in Asada that the “processing circuit” of Asada can be programmed to perform the claimed functions. Applicant has carefully reviewed Asada and has found no mention of a capability of any processing circuit that would allow the circuit to perform such functions. It is neither inherent nor common knowledge that all processors are capable of performing every conceivable function. Specialized processors can have limited functionality. To the extent the Examiner is using “Official Notice” that the Asada controller can be programmed as claimed, that Official Notice is traversed for the foregoing reasons, and documentary evidence is requested.

Regardless, central to the Examiner’s rejection is the allegation that the limitation in question does not constitute a *structural* limitation. (See September 6, 2006 office action at p.5). In this Response, claim 1 has been amended such that the processing circuit is *configured* to carry out the limitation in question. Thus, the processing circuit now has a structural limitation of needing to be configured to, via software and/or hardware, carry out the claimed limitation of generating a first control output based on at least one set point and the process value.

Because Asada does not teach a processing circuit “configured to generate a first control output based on at least one set point and the process value...”, as recited in claim 1, it is respectfully submitted that Asada does not disclose or suggest each and every element of

claim 1. As a consequence it is respectfully submitted that the anticipation rejection of claim 1 over Asada is in error and should be withdrawn.

III. Claims 2, 6-9 and 11

Claims 2, 6-9 and 11 all stand rejected as anticipated by Asada. Claims 2, 6-9 and 11 all depend from and incorporate all of the limitations of claim 1. Accordingly, for at least the same reasons as those discussed above in connection with claim 1, it is respectfully submitted that the anticipation rejections of claims 2, 6-9 and 11 over Asada are in error and should be withdrawn.

IV. The Rejection of Claim 21 over Asada is in Error

Claim 21 also stands rejected as allegedly being anticipated by Asada. Claim 21 includes, among other things, a limitation directed to a battery operably connected to provide power to the processing circuit. In addition, claim 21 recites a limitation: “wherein the at least one MEMs sensor device and the processing circuit are integrated onto a first substrate, and wherein the battery is secured to the first substrate.” Thus, the MEMs sensor and processing circuit are integrated onto a first substrate, and a battery is secured to the first substrate. Figs. 12a and 12b of the present application show an exemplary device 1200 that has these features.

Asada does not teach a battery that is secured to a first substrate, where a MEMS device and a processing circuit are integrated onto the first substrate. While Asada does describe a “sensorstrate” substrate that includes a substrate and arguably includes an integrated “signal processing” device, Asada does *not* teach or suggest that a battery is secured to that “sensorstrate”. In particular, Asada only teaches that the “sensorstrate” is “a platform for support of interface, signal processing, and communication circuits.” While Asada

mentions the use of a battery, Asada specifically *excludes* the battery as part of the circuits that can be supported by the “sensorstrate”. (See Asada at sections 3 and 4).

Accordingly, because Asada does not disclose or suggest a battery that is secured to a first substrate as claimed, Asada fails to disclose or suggest each and every element of claim 21. For at least this reason, it is respectfully submitted that the anticipation rejection of claim 21 over Asada is in error and should be withdrawn.

V. Claims 22-24

Claims 22-24 all stand rejected as being anticipated by Asada. Claims 22-24 all depend from and incorporate all of the limitations of claim 21. Accordingly, for at least the same reasons as those discussed above in connection with claim 21, it is respectfully submitted that the anticipation rejections of claims 22-24 over Asada are in error and should be withdrawn.

VI. The Rejection of Claim 1 Over Graviton is in Error

Applicants respectfully traverse the rejection of claim 1 over Graviton, primarily for reasons set forth in the Appeal Brief dated June 20, 2006. In particular, Graviton fails to disclose a device that includes a processing circuit “operable to generate a first control output based on at least set point and the process value obtained from the at least one MEMs sensor device”, as called for in claim 1. As clearly taught by Graviton at page 16, line 30 to page 17, line 9, control outputs are generated by a separate node 70 in Graviton. Control outputs are *not* generated by the sensor assembly 50.

In response to the Applicant's argument, the Examiner has reiterated prior arguments *and* has proffered a new argument based on another sentence of Graviton with regard to the generation of a control output. The new argument is based on a sentence on page 27, lines 16-17 of Graviton. This sentence reads: "Such control may be effected at a purely local level, such as through the action of the processor 60 itself, or through processing at the node 70, or yet at the processor/end user 110." (Graviton at p.27, lines 16-17). The phrase "such control" appears to reference a prior sentence, which reads, "...the sensing of ingredients detects a situation requiring action to ensure that the final products conforms to the specifications, then a feedback or closed loop action may be taken so as to change aspects of the ingredients or the recipe or method of treatment of those ingredients in a process." Thus, the Examiner correctly notes that some level of control "may be effected" through the action of the processor 60 in this single, specialized embodiment of Graviton.

However, the above referenced teaching does not establish a *prima facie* case of anticipation with respect to claim 1. In particular, nothing in the above-described embodiment of Graviton mentions or suggests that the control value is *provided as an output digital signal* to another building automation system device.

To this end, it is noted that claim 1, as amended recites that the processing circuit is configured to "cause the output digital signal to be communicated to another element of the building automation system", and that the output digital signal is representative of the claimed "first control output". Thus, the processing circuit of claim 1 is configured to generate a first control output, and is configured to cause a digital output signal representative of the first control output to be communicated to another building automation system element.

By contrast, the embodiment of page 27, lines 17-18 of Graviton is, to the best one can guess, a single chip sensing and actuating module. To this end, please note that in sentence following the that of page 27, lines 17-18, Graviton appears to teach that indeed a single sensor/processor/actuator device is contemplated for this embodiment. (See Graviton, p.27, at lines 18-20). Reading the two adjacent sentences of page 27, lines 17-20 together, it becomes apparent that the “control ... effected at a purely local level... through the action of the processor 60 itself” identifies a completely self-contained sensor/actuator device.

A single chip sensing and actuating module is self-contained, and would have no reason to communicate a digital signal representative of the control signal to another building automation system element. Thus, even if the processor 60 of Graviton in the embodiment of page 27, lines 17-20 were to generate control signals as claimed, nothing in Graviton suggests that the processor 60 of Graviton communicates such signals to another system element in digital format.

Thus, even if the sentence at page 27, lines 17-18 of Graviton were interpreted as disclosing a module having a sensor and a processor that generates a control output, the processor of that module would *not* generate an output digital signal representative of the control output and cause the digital signal to be communicated to another element in the system, as called for in claim 1. For at least this reason, Graviton fails to teach or suggest each and every element of claim 1.

VII. Claims 2, 5-7, 11 and 12

Claims 2, 5-7, 11 and 12 all stand rejected as anticipated by Graviton. Claims 2, 5-7, 11 and 12 all depend from and incorporate all of the limitations of claim 1. As discussed above, Graviton fails to teach or suggest a processing circuit that is integrated with a MEMS sensor and generates a control output based on set point information and sensor values, and which is configured to communicate a digital output signal representative of the control output to another element in the building automation system. Accordingly, for at least the same reasons as those discussed above in connection with claim 1, it is respectfully submitted that the rejections of claims 2, 5-7, 11 and 12 are in error and should be withdrawn.

VIII. Claims 21 and 22

Claims 21 and 22 also stand rejected as allegedly being anticipated by Graviton. Independent claim 21 includes a limitation directed to a battery that is *secured to the substrate* on which a MEMS sensor and a processing circuit are integrated. As discussed in the prior responses and the Appeal Brief dated June 20, 2006, Graviton does not teach or suggest an apparatus that includes a processing circuit and a MEMS sensor integrated onto a first substrate, wherein the apparatus further includes a battery secured to the first substrate.

In the most recent office action, the Examiner responded to the argument that Graviton failed to disclose a battery secured to the first substrate with an inherency argument. In particular, regarding the connection of the battery, the Examiner providing the following argument:

...and wherein the battery is secured to the first substrate (pg. 15 line 31 – pg. 16 line 3): “the device may be made compact” EN: *The device is compact, so the battery is inherently “secured” to the*

substrate. If the battery is not "secured" to the substrate, either directly or indirectly via some intermediary component, then where is it?).

(September 6, 2006 office action at p.10).

Applicants respectfully submit that there are multiple ways to electrically connect a chip (such as is taught in Graviton) to a battery, wherein the battery is *not* secured to the chip. For example, both the chip and the battery may be supported by a common housing, or by one or more circuit boards. (See Kamazaki). If the battery and the chip are merely secured to the same housing, then absent some other connection, they are not "secured" to each other in the ordinary meaning of the word.

One object is not "secured" to another object merely because they are commonly secured to a common housing or structure. For example, a front tire of a vehicle is not secured to a rear tire of a vehicle, even though both are secured (indirectly) to the vehicle chassis.

Claim terms must be given their broadest *reasonable* meaning. It is not reasonable to interpret that a battery "secured to" a substrate means a battery secured to a housing, and a substrate connected to another part of the same housing. While claim 21 does not require that the battery be *directly* secured to the substrate, there must be at least some mounting or supporting relationship between the battery and the substrate. If the battery and substrate are merely secured to the same housing, the battery is not mounted on or supported by the substrate and the substrate is not mounted on or supported by the battery.

Thus, the battery and chip of Graviton may readily be incorporated into a module without securing the battery to the chip, including by use of a common housing or circuit board. Accordingly, because there are multiple alternative ways to build a compact device

having a substrate and a battery such that the battery is *not* secured to the substrate, the mere fact that Graviton discloses a battery and a substrate in a compact design *does not* mean that the battery must necessarily be secured to the substrate. As a consequence, Graviton does not *inherently* disclose a battery secured to a substrate onto which a processing device and sensor device are integrated.

For this reason, it is respectfully submitted that the anticipation rejection of claim 21 over Graviton is in error and should be withdrawn.

In addition, the Examiner queries in the Response to Arguments section of the September 6, 2006 office action, "Applicant argues that neither Graviton nor Yamazaki teach securing a battery to an integrated circuit. Firstly, it is noted that this feature is not claimed. Where do the claims securing a battery to an integrated circuit?". (p.20). Applicants respectfully submit that Applicant's argument may be misunderstood. Page 15 of Applicant's Appeal Brief reads "neither Graviton nor Yamazaki teach or suggest securing a battery to an integrated circuit *substrate*." Claim 21 recites that "the MEMS sensor device and the processing circuit are integrated onto a first substrate, and wherein the battery is secured to the first substrate.". Because the processing circuit is integrated onto the first substrate, the first substrate is, in fact, an "integrated circuit substrate". The battery is secured to the first substrate, and thus is secured to an "integrated circuit substrate". Applicant regrets the misunderstanding.

Claim 22 depends from and incorporates all of the limitations of claim 21. Accordingly, claim 22 is patentable over the prior art for at least the same reasons.

IX. Claims 26-36

Claim 26 is similar to claim 1, except that claim 26 includes a limitation directed to a non-volatile programmable memory supported by the substrate and coupled to the processing circuit. Claims 27-36 have at least the same limitations as they all depend directly or indirectly from claim 26.

It appears that the Examiner has not advanced significant new arguments with respect to claim 26. (See Response to Arguments in the September 6, 2006 office action).

Accordingly, Applicant incorporates the arguments in the Appeal Brief by reference herein.

In general, such arguments set forth that Graviton fails to disclose a device that incorporates processing circuitry and a sensor device integrated onto a single substrate, wherein a programmable non-volatile memory is supported on the substrate. Graviton discloses a single chip embodiment that includes “(optional memory)”. The description of that embodiment does not include flash memory as the “optional memory”. (See e.g. Graviton at Fig. 4 and accompanying text).

As a result, Graviton fails to disclose each and every element of claim 26. It is therefore respectfully submitted that the anticipation rejection of claim 26 over Graviton is in error and should be withdrawn.

Claims 27-36 depend from and incorporate all of the limitations of claim 26. Accordingly, claims 27-36 are patentable over the prior art for at least the same reasons.

Moreover, claims 27-36 all contain additional limitations that are not taught or disclosed in Graviton. These reasons are identified to some extent in the June 20, 2006 Appeal Brief.

X. The Obviousness Rejections of 8-10 and 23-25

Claims 8-10 all depend from and incorporate the limitations of claim 1. Yamazaki does not cure the deficiencies of Graviton with respect to claim 1. Accordingly, for at least the reasons set forth above in connection with claim 1, it is respectfully submitted that the proposed combination of Graviton and Yamazaki does not arrive at any of the inventions of claims 8-10.

Claims 23-35 all depend from and incorporate the limitations of claim 21. Yamazaki does not cure the deficiencies of Graviton with respect to claim 21. To this end, it is noted that the proposed combination of Yamazaki and Graviton does not arrive at a device in which a processing circuit and a MEMS device are integrated onto a first substrate, and wherein a battery secured to the first substrate, as called for in claim 21. Yamazaki teaches that one or more chips may be mounted on a circuit board, and that a battery may be secured to the circuit board. Graviton teaches a chip having a processing circuit and a MEMs device. Thus, the proposed combination of Yamazaki and Graviton results in the Graviton chip being mounted on a circuit board, and a battery mounted on a circuit board. For similar reasons as those discussed above in connection with claim 21, such a structure does not include a battery that is secured to the chip. Instead, the battery and the chip would be secured to a common circuit board, but the battery would not be secured to the chip.

Accordingly, for similar reasons as those set forth above in connection with claim 21, it is respectfully submitted that the proposed combination of Graviton and Yamazaki does not arrive at any of the inventions of claims 23-35.

XI. Conclusion

For all of the foregoing reasons, it is respectfully submitted the applicant has made a patentable contribution to the art. Favorable reconsideration and allowance of this application is, therefore, respectfully requested.

Respectfully submitted,



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